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10/582,231	06/09/2006	Hiroyuki Shioiri	292020US3PCT	2849
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER MOMPER, ANNA M				
ART UNIT		PAPER NUMBER		
3657				
NOTIFICATION DATE		DELIVERY MODE		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/582,231

**Applicant(s)**

SHIOIRI ET AL.

**Examiner**

ANNA MOMPER

**Art Unit**

3657

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

1. Amendment to the claims received 3/24/2009 has been entered. Claims 1, 5, 7 and 15 have been amended. Claims 16-20 have been added.

***Response to Arguments***

2. Applicant's arguments with respect to claims 1 and 15 have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 5-7, 11, 12, 15 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Steuer (GB 929326 A).

As per claim 1, Steuer discloses a belt type continuously variable transmission (Fig. 1), comprising:

two pulley shafts (1, 2) arranged in parallel a predetermined distance apart from each other (Fig. 1);

a movable sheave (4, 6) on each pulley shaft, the movable sheaves being able to slide in an axial direction on the pulley shafts;

a fixed sheave (3, 5) arranged on each pulley shaft so as to face the moveable sheave on each pulley shaft, the fixed sheave and the movable sheave that face each other on each pulley shaft together forming a groove there between; and

a belt (11) wound around the grooves between the movable sheaves and the fixed sheaves that face one another,

wherein at-least one of the movable sheaves is provided with a motor (24, 25), the motor being rotatable in normal and reverse directions to drive the one of the movable sheaves sheave in the axial direction of a pulley shaft of the one of the moveable sheaves,

wherein the motor is provided in a hollow portion of the one of the moveable sheaves, that is located opposite the groove (Fig. 1), and

wherein the motor includes an outer rotor (38, 39, 28, 29, 30, 31 Fig. 2) that is integrated with the one of the moveable sheaves.

As per claim 2, Steuer discloses an integral rotating mechanism which rotates the motor integrally with the movable sheave (the motor is mounted to the shaft), and a relative moving mechanism that moves the motor and the movable sheave relative to one another in the axial direction (the movable sheave is mounted to the ramp 14, 15 which allows relative axial movement between the motor and the movable sheave).

As per claim 3, Steuer discloses a moving direction converting mechanism (Ball and ramp mechanisms 14, 15, 16, 17, 18, 19, 20, 21) that converts force in the direction of rotation, which is driving force from the motor, into force in the axial direction is

provided between the motor and the movable sheave and directly on the motor and the movable sheave (Fig. 1).

As per claim 5, Steuer discloses the motor (24, 25) is provided with an inner rotor (26, 27) which is integrated with the pulley shaft (Fig. 2) and the outer rotor which generates driving force by rotating relative to the inner rotor;

the pulley shaft is provided with a bearing that rotates the outer rotor relative to the pulley shaft (Fig. 1);

and a moving direction converting mechanism (Ball and ramp mechanisms 14, 15, 16, 17, 18, 19, 20, 21) that converts force in the direction of rotation of the outer rotor to force in the axial direction is provided between the outer rotor and the movable sheave.

As per claim 6, Steuer discloses a spline portion provided between the outer rotor and the movable sheave (Fig. 1).

As per claim 7, Steuer discloses a hydraulic pressure chamber (50, 47, 51) which pushes the movable sheave toward the fixed sheave using hydraulic pressure is provided in series with the motor in the axial direction.

As per claim 11, Steuer discloses one of the pulley shafts (1) is a primary side pulley shaft and the other of the pulley shafts (2) is a secondary side pulley shaft, the movable sheave provided integrally with the motor is arranged on the primary side pulley shaft (Fig. 1), and a plurality of pushing mechanisms that push the movable sheave toward the fixed sheave are provided on the movable sheave on the secondary

side pulley shaft (Fig. 1, a motor 25 and ball and ramp mechanism 13, 19, 21 is provided on the secondary pulley).

As per claim 12, Steuer discloses at least one of the pushing mechanisms is a torque cam (Fig. 1, ball and ramp mechanism 13, 19, 21).

As per claim 15, Steuer discloses a belt type continuously variable transmission (Fig. 1), comprising:

two pulley shafts (1, 2) arranged in parallel a predetermined distance apart from each other (Fig. 1);

a movable sheave (4, 6) on each pulley shaft, the movable sheaves being able to slide in an axial direction on the pulley shafts;

a fixed sheave (3, 5) arranged on each pulley shaft so as to face the moveable sheave on each pulley shaft, the fixed sheave and the movable sheave that face each other on each pulley shaft together forming a groove there between; and

a belt (11) wound around the grooves between the movable sheaves and the fixed sheaves that face one another,

a motor (24, 25) integrally provided with one of the movable sheaves and capable of driving said the one of the movable sheaves, the motor being rotatable in normal and reverse directions to drive said movable sheave

wherein the motor includes an inner rotor (26, 27) that is integrally assembled with a pulley shaft of the one of the moveable sheaves (Fig. 2) and an outer rotor (38, 39, 28, 29, 30, 31 Fig. 2) that generates driving force that drives the one of the

moveable sheaves in the axial direction of the pulley shaft by rotating relative to the inner rotor.

As per claim 17, Steuer discloses a hydraulic pressure chamber (50, 47, 51) which pushes the movable sheave toward the fixed sheave using hydraulic pressure is provided in series with the motor in the axial direction (Fig. 1).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steuer (GB 929326 A) in view of Dick (US 5,527,225).

As per claim 4, Steuer fails to explicitly disclose the moving direction converting mechanism includes a moving screw portion.

Dick discloses a transmission (Fig. 6) wherein a screw portion is utilized to convert the rotary motion of the motor into an axial motion of the movable pulley sheave (Fig. 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the transmission of Steuer to include the moving direction converting mechanism includes a moving screw portion, as taught by Dick, for the purpose of selecting an appropriate means to transmit motion to the pulley sheave.

7. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steuer (GB 929326 A) in view of Fritzer et al. (US 6,786,844 B2).

As per claims 13 and 14, Steuer discloses all elements of the claimed invention as disclosed in claim 12 above, but fails to explicitly disclose an absorbing mechanism that makes the torque cam operate smoothly is provided on the fixed sheave on the secondary side pulley shaft or the movable sheave on the secondary side pulley shaft (claim 13) and a structure which changes the degree of absorption according to the speed ratio is provided in the absorbing mechanism (claim 14).

Fritzer et al. discloses a contact pressure regulation system (12) for a continuously variable transmission (10) in which a torque cam system (50, 52) is utilized on the output shaft, having a damping mechanism (322, 314,312) to ensure smooth operation and having a structure which changes the degree of absorption of the absorbing mechanism (314,316) according to the speed ratio (i, Fig. 12, Fig. 13, Col. 22, Ln. 15-29).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the continuously variable transmission of Steuer to include a damping mechanism, as taught by Fritzer et al., for the purpose of reducing vibrations.

8. Claims 1, 8-10, 15 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmid (US 6,669,588 B2) in view of Steuer (GB 929326 A).

As per claim 1, Schmid discloses a belt type continuously variable transmission comprising:

a pulley shaft (6, 60)



a movable sheave (4) on the pulley shaft, the movable sheave being able to slide in an axial direction on the pulley shaft;

a fixed sheave (2) arranged on the pulley shaft so as to face the moveable sheave on each pulley shaft, the fixed sheave and the movable sheave that face each other on each pulley shaft together forming a groove there between; and

a belt (18) wound around the grooves between the movable sheave and the fixed sheave that face one another,

wherein at-least one of the movable sheaves is provided with a piston (piston 34 having arm 32, 33), movable in s forward and reverse directions to drive the one of the movable sheaves sheave in the axial direction of a pulley shaft of the one of the moveable sheaves,

wherein the motor is provided in a hollow portion of the one of the moveable sheaves that is located opposite the groove (Fig. 2, Fig. 4).

Schmid fails to explicitly disclose a second pulley arranged in parallel to the first pulley and the motor being rotatable in normal and reverse directions and having an outer rotor that is integrated with the one of the movable sheaves.

Steuer discloses a transmission (Fig. 1) having two pulley shafts (1, 2) arranged in parallel a predetermined distance apart from each other (Fig. 1) each with a movable sheave (4, 6) and a fixed sheave (3, 5) and wherein at-least one of the movable sheaves is provided with a motor (24, 25), the motor being rotatable in normal and reverse directions and includes an outer rotor (38, 39, 28, 29, 30, 31 Fig. 2) that is integrated with the one of the moveable sheaves.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the transmission of Schmid to include a second pulley and the motor being rotatable in normal and reverse directions and having an outer rotor, as taught by Steuer, for the purpose of selecting an appropriate means for controlling hydraulic pressure.

As per claim 8, Schmid discloses at least one wall surface (34) that forms the hydraulic pressure chamber is formed by the motor (Fig. 2, Fig. 4).

As per claim 9, Schmid discloses the motor is a hydraulic motor and an oil chamber in the motor and the hydraulic pressure chamber are arranged facing one another in the axial direction across the wall surface formed by the motor (Fig. 2, Fig. 4).

As per claim 10, Schmid discloses the oil chamber in the motor and the hydraulic pressure chamber are connected to each other (Fig. 2, Fig. 4).

As per claim 15, Schmid discloses a belt type continuously variable transmission comprising:

- a pulley shaft (6, 60)

- a movable sheave (4) on the pulley shaft, the movable sheave being able to slide in an axial direction on the pulley shaft;

- a fixed sheave (2) arranged on the pulley shaft so as to face the moveable sheave on each pulley shaft, the fixed sheave and the movable sheave that face each other on each pulley shaft together forming a groove there between; and

- a belt (18) wound around the grooves between the movable sheave and the fixed sheave that face one another,

wherein at-least one of the movable sheaves is provided with a piston (piston 34 having arm 32, 33), movable in s forward and reverse directions to drive the one of the movable sheaves sheave in the axial direction of a pulley shaft of the one of the moveable sheaves,

wherein the motor is provided in a hollow portion of the one of the moveable sheaves that is located opposite the groove (Fig. 2, Fig. 4).

a piston (34, 32, 33) integrally provided with one of the movable sheaves and capable of driving said the one of the movable sheaves,

Schmid fails to explicitly disclose a second pulley arranged in parallel to the first pulley and a motor being rotatable in normal and reverse directions and wherein the motor includes an inner rotor that is integrally assembled with a pulley shaft of the one of the moveable sheaves and an outer rotor that generates driving force that drives the one of the moveable sheaves in the axial direction of the pulley shaft by rotating relative to the inner rotor.

Steuer discloses a transmission (Fig. 1) having two pulley shafts (1, 2) arranged in parallel a predetermined distance apart from each other (Fig. 1) each with a movable sheave (4, 6) and a fixed sheave (3, 5) and wherein at-least one of the movable sheaves is provided with a motor (24, 25), the motor being rotatable in normal and reverse directions and includes an outer rotor (38, 39, 28, 29, 30, 31 Fig. 2) that is integrated with the one of the moveable sheaves and wherein the motor includes an inner rotor (26, 27) that is integrally assembled with a pulley shaft of the one of the moveable sheaves (Fig. 2) and an outer rotor (38, 39, 28, 29, 30, 31 Fig. 2) that

generates driving force that drives the one of the moveable sheaves in the axial direction of the pulley shaft by rotating relative to the inner rotor.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the transmission of Schmid to include a second pulley, an inner rotor integrally assembled with a pulley shaft and an outer rotor, as taught by Steuer, for the purpose of selecting an appropriate means for controlling hydraulic pressure.

As per claim 18, Schmid discloses at least one wall surface (34) that forms the hydraulic pressure chamber is formed by the motor (Fig. 2, Fig. 4).

As per claim 19, Schmid discloses the motor and the hydraulic pressure chamber are arranged facing one another in the axial direction across the wall surface formed by the motor (Fig. 2, Fig. 4).

As per claim 10, Schmid discloses the oil chamber in the motor and the hydraulic pressure chamber are connected to each other (Fig. 2, Fig. 4).

9. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steuer (GB 929326 A) in view of Dick (US 5,527,225).

As per claim 16, Steuer fails to explicitly disclose the moving direction converting mechanism includes a moving screw portion positioned between the movable sheave and the motor so as to convert force in a direction of rotation into force in the axial direction of the pulley.

Dick discloses a transmission (Fig. 6) wherein a screw portion is utilized to convert the rotary motion of the motor into an axial motion of the movable pulley sheave

positioned between the movable sheave and the motor so as to convert force in a direction of rotation into force in the axial direction of the pulley. (Fig. 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the transmission of Steuer to include a screw portion between the movable sheave and the motor, as taught by Dick, for the purpose of selecting an appropriate means to transmit motion to the pulley sheave.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA MOMPER whose telephone number is (571)270-5788. The examiner can normally be reached on M-F 6:00-3:30 (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on (571) 272-7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bradley T King/  
Primary Examiner, Art Unit 3657

am